CALIFORNIA STATE DEPARTMENT OF PUBLIC HEALTH
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Weekly Bulletin

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Entered as second-class matter February 21, 1922, at the post office at Sacramento, California, under the Act of August 24, 1912. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917.

Vol. XVII, No. 34 September 17, 1938 GUY P. JONES EDITOR

The Prevention of Hearing Impairment

Impaired hearing is of common occurrence. The White House Conference in 1930 reported three million cases of impaired hearing in children throughout the United States. There are no available statistics pertaining to the number of adults whose hearing may be impaired, but it is apparent that a large number of such adults are found in every community.

Mr. George E. Coleman of Santa Barbara has established a fund in the Hooper Foundation for Medical Research, University of California, where research is made into the cause and prevention of deafness. Mr. Coleman himself is a medical research worker.

He has recently prepared a report pertaining to research and the problems related to deafness that indicates the important roles that various general, as well as epidemic, diseases play in impaired hearing. Mr. Coleman's report reads in part:

"The anatomy and physiology of the ear have been studies intensively for decades all the way up the evolutionary scale from the lower fishes and amphibians through mammals to man. It begins with the fetus a few weeks old and continues after birth to adults. Much has yet to be learned in this way concerning causes and the development of bone disease; moreover, we do not yet know exactly how we hear. We must find this out. Research is never static. A new discovery in one scientific field, in another disease or a related biological science gives an impetus to the review of our present concepts or a clue to the solution of hidden problems. The newer technic for preparing animal tissues for microscopic study has revealed finer structures, with their probable function, hitherto unknown. This makes possible a more accurate study in animals of certain factors resulting in deafness.

The marvelous advance in acoustical engineering has provided means for the intensive study of the physiology of hearing in dogs, cats and rabbits. These animals must be used also by another method which includes training them, just as you might train your own dog, to respond only to definite pure tones. These studies give us more knowledge of the pathways of nerve impulses, the analysis of sound by the receptors in the brain and just where the latter are situated. By the use of these methods various points are being mapped in the inner ear (cochlea) from which originate impulses for the different tones including those of speech. In none of this work is there any suffering. In the electrical work the animals are deeply anaesthetized and remain so until they die.

Diets and dietary deficiencies, especially in the vitamins, can very well have a profound effect upon the organ of hearing as a whole as they do upon so many other structures functioning in the body. Considerable is known about the effect on the nervous system of a lack of vitamine A and principally B (with its various subdivisions) in the production of such diseases as beri-beri, pellagra and black tongue in dogs. It would be important to confirm the suspicion that such a deficiency might play a part in nerve deafness. In our laboratory we are working on this problem. The acoustic nerve and its endings in the cells of the inner ear of animals are being

studied microscopically with some evidence of changes in those animals on B deficient diets.

Vitamin work must be done on animals. There is no other way. Such work was the basis for the prevention and cure of rickets in children and vitamin dosage must be standardized on animals. This is true of insulin, digitalis, ergot, serums and many other products. Again, there is no other way.

Ductless glands. Studies particularly of the pituitary body which lies in a little pocket within the skull just under the brain, are being made in some hearing laboratories. This is called the master gland because of its apparent influence on other glands. Because of this influence it is being treated in animals with X-rays, but the subject is too complicated to explain further. The products of this gland as well as those of some of the glands of sex and reproduction, may also play a part in maintaining a normal hearing organ. We do not know yet but must find out.

Otosclerosis is a disease of the bone surrounding the inner ear. It causes, primarily, conduction deafness and later on, almost inevitably, nerve deafness follows. Authorities estimate that it is responsible for more than 50 per cent of all adult deafness. Its cause is absolutely unknown and there is no known cure. Like cancer it is one of the most baffling problems in all medical science. In every country it is being studied in the only way possible—on animals. These include dietary and glandular products affecting growth and the calcium-phosphorous ratio in the blood and bones. These methods have proven efficacious in other bone diseases. We can reproduce in animals other very similar bone diseases which do not cause deafness but we can not yet produce otosclerosis experimentally. New discoveries in physiology keep suggesting newer methods of approach. If we can learn how otosclerosis develops and what environmental factors are responsible then there may come prevention, perhaps amelioration and hope for the several million people suffering from the tragedy of this progressive malady. Without the continued use of the larger omniverous animals there will be no hope.

Heredity. A tendency is common in some families to acquire certain diseases like diabetes, cancer, otosclerosis and early degeneration of the auditory nerve which do not become manifest until varying periods after birth. Heredity in these cases may be defined as the transmission from parents to offspring of an abnormal susceptibility to the effect of definite environmental factors, as yet unknown, which initiate the development of the disease. It may be that some of these factors reside in the blood of the mother which nourishes the fetus after fertilization and implantation in the uterus. It is known that in breast cancer in mice some factor is transmitted in the milk of susceptible mothers to the offspring of nonsusceptible cancer strains which nurse from these susceptible mothers. Deafmutism in most cases is hereditary, in others congenital but the breeding of deaf cats, waltzing mice and guinea pigs will help elucidate the problem. Domesticated and wild animals have nearly all the ear diseases and caused in the same way as those in man. We must be permitted to have the animals of our choice and not be restrained from using dogs and cats.

Infectious organisms cause deafness in four ways: in the middle ear alone, in the inner ear alone, in both at the same time or from poisons (toxins) generated elsewhere in the body and carried by the blood to the inner ear (degeneration in special cells with their nerve endings). Bacteria after infecting the ears may spread to the lining of the brain or elsewhere and cause a general intoxication. The first five important diseases causing deafness are: meningitis (several species), scarlet fever (streptococci), measles, influenza (ultra-microscopic virus) and pneumonia (several species. Almost all that we know about their cause, prevention and cure, especially with serums and drugs, is due to animal experimentation. Without their use such an effective drug as sulfanilimide would not have been available. Formerly the death rate from meningitis when caused by a certain kind of streptococcus has been about 95 per cent. Recent statistics show that the use of this drug in such cases in one area has saved one hundred lives.

CAMPAIGN TO PREVENT DEAFNESS GROWS

A committee of doctors within the Otological Section of the California Medical Association, for almost five years, has been engaged in an educational campaign to prevent impairments of hearing.

In 1936 the committee was increased to fifty members, each one of whom was an accredited otologist. At the last meeting of the State Medical Society their activities received an enthusiastic response. This year the state has been divided into eleven geographical areas with a district chairman, each of whom operates under a supervising state director.

Francis L. Rogers, M.D., of Long Beach, is State Director, and the following are the eleven district chairmen:

District No. 1—Dr. J. Roy Jones, Sacramento.
District No. 2—Dr. Charles A. Broaddus, Stockton.
District No. 3—Dr. Dorothea Lee, San Jose.
District No. 4—Dr. Harold A. Fletcher, San Francisco.
District No. 5—Dr. George W. Walker, Fresno.
District No. 6—Dr. Joseph D. Lewis, Santa Barbara.
District No. 7—Dr. Isaac H. Jones, Los Angeles.
District No. 8—Dr. Harold D. Smith, Pomona.
District No. 9—Dr. Ray M. Moose, San Bernardino.
District No. 10—Dr. Ben K. Parks, Long Beach.
District No. 11—Dr. Frank A. Burton, San Diego.

Dr. Dewey R. Powell of Stockton is Section Chairman.

The ten-point program outlining the definite objectives of the campaign is as follows:

"(1) *Cooperation.* Problems of the hard of hearing affect 10 to 15 per cent of our adult population, and 5 to 8 per cent of school children are found to have hearing defects. Every community can and should unite in directing its educational, social, medical, and economic forces to relieve deafness.

(2) *Hearing Tests.* Finding the hard of hearing by individual or group hearing tests is now practicable. Every school system should own or rent such adequate equipment and yearly records should be kept for future checking. Every pre-school child should have a hearing test before entering school. All this we earnestly advise.

(3) *Lip Reading and Voice.* Speech and voice training is a major aid in rehabilitating the hard of hearing. Universities and teachers colleges now give teachers courses in this specialized work.

(4) *Ideal Otologists* are socially and economically minded and possess medical training as ear specialists. As such they can and will render superior service, both as advisers and in preventive and curative medical care to the hard of hearing.

(5) *Audiometers and Audiometrists.* The examination of every person where hearing is failing, is a medical and public health problem. "Audiometry" is the science of measuring hearing loss and as such is a medical procedure. Otologists should provide this service to their hard of hearing patients.

(6) *Diagnostic Clinics.* Deafness is primarily a medical and public health problem. Every hard of hearing person should have expert medical advice from an otologist and this includes measuring his hearing. Their examination will tell him whether a hearing aid will help him (not what make to buy). Much money will be saved, and disappointment avoided by following this plan. Diagnostic clinics for the indigent are approved.

(7) *Health Education.* Otologists are urged to participate in public health education by lectures, radio broadcasts, and addresses especially during ANNUAL HEARING WEEK, lecturing before schools and public meetings dealing with problems of the hard of hearing. Otologists should at all times be prepared to offer reliable advice concerning causes and types of deafness and questions concerning the value of hearing aids, also where and how the deafened may become socially and economically readjusted to their physical and mental handicaps.

(8) *Hearing Aids* are single (individual) or multiple (for groups) as in a class, theatre, or church. Modern sound and electrical engineers have brought great joy and new life to the hard of hearing. The modern hearing aid is a sound collector and transmitter. There are several types similar in principle. Their manufacture and sale has greatly increased and their efficiency improved the past five years. Schools are now equipping class rooms with multiple (10 to 20 phones) hearing aids for deafened pupils.

(9) *Fee Splitting.* The otologists' committee desires to express again its unqualified disapproval of the giving or receiving of any commission, bonus, or other secret fee offered or paid by manufacturers or their authorized salesmen to otologists for referring patients to them.

(10) *Legislation.* California now has a law (1937 session) which permits boards of education to appropriate school funds for the purchase of equipment and testing of pupils for sight and hearing defects. In New York State annual hearing tests of all school children are required by law (1935). This committee heartily approves the adoption of such a law in California. It is educationally, socially, and economically sound in principle and would be found so in practice."

DISEASES REPORTABLE IN CALIFORNIA

REPORTABLE ONLY

Anthrax
Beri-beri
Botulism
Chancroid
Coccidioidal Granuloma
Dengue*
Fluke Infection
Food Poisoning
Glanders†
Hookworm
Jaundice (Infectious)
Lymphogranuloma Inguinale
Malaria*
Pellagra
Pneumonia (Lobar)
Relapsing Fever
Rocky Mountain Spotted Fever
Septic Sore Throat
Tetanus
Trichinosis
Tularemia
Undulant Fever

ISOLATION OF PATIENT

Chickenpox
Dysentery (Amoebic)
Dysentery (Bacillary)
Erysipelas
German Measles
Gonococcus Infection
Influenza
Measles
Mumps
Ophthalmia Neonatorum
Psittacosis
Rabies (Animal)
Rabies (Human)
Syphilis
Trachoma
Tuberculosis
Whooping Cough

QUARANTINABLE

Cholera†
Diphtheria
Encephalitis (Epedemic)
Leprosy
Meningitis (Epedemic)
Plague†
Acute Anterior Poliomelitis
Scarlet Fever
Smallpox
Typhoid and Paratoid Typhoid Fever
Typhus Fever
Yellow Fever†

* Patients should be kept in mosquito-free room.
† Cases to be reported to State Department of Public Health by telephone or telegraph and special instructions will be issued.

MORBIDITY

Complete Reports for Following Diseases for Week Ending September 10, 1938

Chickenpox

28 cases: Alameda County 1, Berkeley 5, Antioch 2, Los Angeles County 1, Alhambra 1, Los Angeles 2, Redondo 3, Sacramento 1, San Diego 2, San Francisco 7, Lompoc 1, Palo Alto 1, Siskiyou County 1.

Diphtheria

14 cases: Berkeley 3, Pittsburg 1, Kings County 1, Los Angeles County 1, Alhambra 1, Los Angeles 3, Monterey 1, Santa Barbara 1, Santa Clara 1, Ventura County 1.

German Measles

15 cases: Alameda County 1, Berkeley 2, Los Angeles County 2, Long Beach 1, Los Angeles 4, Laguna Beach 1, Riverside County 1, Sacramento 3.

Influenza

6 cases: Los Angeles County 4, San Francisco 1, Manteca 1.

Malaria

12 cases: Brawley 1, Los Angeles County 2, Solano County 1, Tulare County 2, Yolo County 4, Winters 1, California 1.*

Measles

74 cases: Berkeley 3, Contra Costa County 1, Kern County 2, Los Angeles County 5, Culver City 1, Glendale 1, Long Beach 2, Los Angeles 7, Pomona 1, San Fernando 1, Whittier 1, Bell 1, Monterey County 1, Orange County 1, Anaheim 3, La Habra 2, Riverside County 1, Riverside 1, Coronado 2, Oceanside 1, San Diego 2, San Francisco 24, San Luis Obispo County 1, Santa Barbara 1, Santa Clara County 1, San Jose 3, Yuba City 1, Tehama County 2, Fillmore 1.

Mumps

81 cases: Alameda County 6, Berkeley 11, Oakland 1, San Leandro 3, Contra Costa County 4, Antioch 1, Kern County 1, Los Angeles County 5, Long Beach 2, Los Angeles 7, Monrovia 1, Pasadena 1, Maywood 1, Los Banos 3, Orange County 1, Plumas County 3, Sacramento 1, Redlands 1, San Diego County 1, San Diego 3, San Francisco 11, San Luis Obispo County 1, San Luis Obispo 2, San Mateo County 1, Santa Barbara 2, Palo Alto 1, San Jose 1, Sierra County 3, Sonoma County 1, Yolo County 1.

Pneumonia (Lobar)

14 cases: Bakersfield 1, Culver City 1, Inglewood 2, Long Beach 1, Los Angeles 6, Santa Monica 1, Maywood 1, San Francisco 1.

Scarlet Fever

46 cases: Contra Costa County 1, Pittsburg 1, Fresno 1, Glenn County 1, El Centro 1, Hanford 1, Los Angeles County 6, Alhambra 1, Huntington Park 1, Los Angeles 7, Gardena 2, Monterey County 4, Napa 1, Orange County 1, Riverside County 1, San Bernardino County 1, San Diego 1, San Francisco 3, Santa Barbara 1, Santa Clara County 2, San Jose 1, Sunnyvale 2, Dunsmuir 1, Solano County 1, Sonoma County 2, Tehama County 1.

Smallpox

4 cases: Los Angeles County 1, Los Angeles 1, Gilroy 2.

Typhoid Fever

15 cases: Pittsburg 1, Fresno County 1, Los Angeles 4, San Fernando 1, Madera County 1, Nevada City 1, Sacramento County 1, San Francisco 4, California 1.*

Whooping Cough

118 cases: Alameda County 8, Alameda 2, Berkeley 1, Fresno County 4, Kern County 3, Los Angeles County 9, Alhambra 1, Culver City 1, Huntington Park 2, Los Angeles 12, Monrovia 1, Pasadena 2, Pomona 2, Santa Monica 3, Lynwood 1, South Gate 1, Marin County 1, San Rafael 1, Los Banos 1, Monterey County 1, Orange County 1, Fullerton 2, Santa Ana 5, Plumas County 1, Sacramento 2, San Bernardino County 3, Redlands 2, El Cajon 1, Oceanside 4, San Diego 3, San Francisco 19, San Joaquin County 2, Stockton 4, San Mateo County 1, Santa Maria 1, Santa Clara County 1, Sonoma County 2, Petaluma 3, Ventura County 3, Fillmore 1.

Dysentery (Amoebic)

One case: San Bernardino County.

Dysentery (Bacillary)

11 cases: Los Angeles 1, Sonoma County 10.

Pellagra

5 cases: Bell 1, Sacramento 1, San Francisco 1, Sonoma County 2.

Poliomyelitis

5 cases: Kern County 3, San Diego 1, Woodland 1.

Trachoma

5 cases: Los Angeles.

Encephalitis (Epidemic)

One case: San Bernardino County.

Paratyphoid Fever

One case: California.*

Undulant Fever

5 cases: Long Beach 1, Santa Monica 1, San Bernardino County 1, San Jose 1, Yolo County 1.

Tularemia

2 cases: California.*

Coccidioidal Granuloma

One case: Fresno County.

Septic Sore Throat

One case: San Diego.

Leprosy

One case: Los Angeles.

Relapsing Fever

3 cases: El Dorado County 1, San Bernardino County 1, Tulare County 1.

Rabies (Animal)

15 cases: Kern County 1, Los Angeles County 1, Hermosa 1, Los Angeles 7, Santa Monica 1, Salinas 1, Riverside 2, San Joaquin County 1.

* Cases charged to "California" represent patients ill before entering the state or those who contracted their illness traveling about the state throughout the incubation period of the disease. These cases are not chargeable to any one locality.

We wish to know what is going on; what the progress of science is; what leaders of the nations are doing; how our civilization is faring; and whether our community is what it should be. Though the matters to be dealt with are multifarious, one thing comforts us; only a people rich in culture has a wealth of problems. Nations that have slipped backward have been governed too little by what they knew or might have known, too much by indifference or superstition. Great changes swept over them before they realized what was happening. We wish to be alive to our country's needs and play a part in meeting them. We aspire to be free, realizing that freedom in our world of dense population is no longer a by-product of vacant lands, but a cultural achievement.—Leon J. Richardson.

59605 9-38 5800 *printed in* CALIFORNIA STATE PRINTING OFFICE